

## **REMARKS**

Claims 1-15 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

### **REJECTION UNDER 35 U.S.C. § 112**

Claims 1-15 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

The present claims are to a non-polymeric coating composition having at least one monomeric material that has a plurality of active hydrogen groups, at least one crosslinker reactive with the monomeric material, and a crystalline reaction product of an amine and an isocyanate. Methods of coating a substrate with the coating composition are also included. The monomeric material is common to all claims, and claims 4-7 further describe various embodiments of the at least one monomeric material. For example, claims 4-7 (see also paragraphs [0017] to [0020]) are monomeric materials generated by reacting compound (1) with compound (2) and/or a first material (A) with a second material (B). This is not a polymerization reaction where multiple monomers or subunits are linked together. Instead, it is simply an addition of one compound/material to another compound material to form a monomer. The two addition components/materials are dissimilar; thus, the product is not an oligomer or polymer of repeating subunits.

The preamble of independent claim 1 and the body of independent claim 13 also recite a “non-polymeric coating composition” in reference to the at least one monomeric material having a plurality of active hydrogen groups. That is, the present claims include a monomeric material, which is not a polymer that is formed of repeating monomer subunits; and a skilled artisan appreciates that a polymer is composed of repeating monomer units. Examples of monomeric materials are presented in the specification in paragraphs [0013] to [0027] and the U.S. patent references cited therein. For instance, examples of the monomeric materials of claims 4-7 are described in paragraphs [0017] to [0020].

A skilled artisan would readily appreciate that the at least one monomeric material is non-polymeric in the coating composition. It is not until the coating composition is applied to a substrate and subsequently cured, by thermosetting for example, that the at least one monomeric material reacts with the at least one crosslinker. Furthermore, the background of the specification differentiates the present invention from prior art that uses resins of very low molecular weight polymeric or oligomeric materials. These prior art polymeric / oligomeric materials are susceptible to sagging. See paragraph [0004]. The present invention, however, provides for coating compositions of extremely low molecular weight monomeric materials that do not have the sagging problems of the prior art. Thus a skilled artisan would readily appreciate what is meant by “non-polymeric” in view of the present specification and claims read as a whole. Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

## **REJECTION UNDER 35 U.S.C. § 102 – BOISSEAU**

Claims 1-3 and 7-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278). This rejection is respectfully traversed.

The present invention is to non-polymeric coating compositions, and methods employing such compositions, that have at least one monomeric material having a plurality of active hydrogen groups. That is, the present claims include a monomeric material, which is not a polymer. Polymers are formed of repeating monomer subunits, as is generally known to a skilled artisan. Examples of monomeric materials are presented in the specification in paragraphs [0013] to [0027].

The Boisseau et al. reference discloses coating compositions and coating methods having a film-forming component (a). The film-forming component (a) may be polymeric or oligomeric and will generally comprise one or more compounds or components having a number average molecular weight of from 900 to 1,000,000, for example. See Boisseau paragraph [0048]. Examples of polymer resins are listed in Boisseau paragraph [0051]. The molecular weight of polymers refers to the number average molecular weight (Boisseau paragraph [0052]); i.e., the number average molecular weight is the total weight of the sample divided by the number of molecules in the sample, thereby averaging a mixed population of polymers formed of different numbers of repeating subunits. Boisseau also discloses how to prepare polymers (for use as the film-forming component) from monomers. See Boisseau paragraph [0054]; see also paragraphs [0063] to [0098] for preferred carbamate functional polymers, polyester polymers, and polyurethane polymers. Furthermore, the only reference to

monomers in Boisseau is in terms of using them to prepare polymers for use as the film-forming component. See Boisseau paragraphs [0052], [0054], and [0055].

Consequently, the Boisseau reference does not anticipate the present invention as the film-forming component is only disclosed as a polymeric or oligomeric material (i.e., it has repeating subunits of monomers), while the present invention is to non-polymeric coating compositions that have at least one monomeric material, including methods employing such compositions. A non-polymeric coating composition having at least one monomeric material, as described in the present invention, is not disclosed in the Boisseau reference. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Withdrawal of the rejection and reconsideration of the claims are respectfully requested.

#### **REJECTION UNDER 35 U.S.C. § 103 – BOISSEAU IN VIEW OF GREEN AND OHRBOM**

Claims 1-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278) in view of Green et al. (U.S. Pat. No. 5,872,195) and Ohrbom et al. (U.S. Pat. No. 5,756,213). This rejection is respectfully traversed.

The present invention is to non-polymeric coating compositions, and methods employing such compositions, that have at least one monomeric material having a plurality of active hydrogen groups. No combination of the cited references discloses the monomeric material of the present invention and there is no suggestion or

motivation in any of the references for removing the polymeric resins of the respective coating compositions in the references to make the non-polymeric coating composition having at least one monomeric material having a plurality of active hydrogen groups.

The Boisseau reference discloses a film-forming material that is a polymeric or oligomeric material. See Boisseau paragraph [0048]. Boisseau does not disclose a non-polymeric coating composition having at least one monomeric material, as in the present invention.

The Ohrbom reference describes a compound (A) that has a carbamate or urea functionality where a compound (A)(1) having a carbamate or urea group and a hydroxyl group is reacted with a compound (A)(2) which may be a dialkyl carbonate, cyclic carbonate, or CO<sub>2</sub>. Reaction of (A)(1) with (A)(2) will result in a compound having the residues of two (or more) (A)(1) compounds linked together by a carbonate group formed from the residue of compound (A)(2). With inclusion of a polyol, a polycarbonate compound can be formed. See Ohrbom col. 2, lines 19-34; see also col. 7, lines 52-67. Thus, at least two (A)(1) compounds are joined by an (A)(2) compound (i.e., at least two (A)(1) subunits/monomers are joined) and/or a polycarbonate polymer is formed. As a result, Ohrbom does not disclose a non-polymeric coating composition having a monomeric material as described in the present invention.

Green et al. discloses a curable coating composition having a polymer resin, curing agent, and a compound (c) having at least one carbamate group that is the reaction product of a hydroxyl group from a ring-opening reaction between an epoxy group and an organic acid group, and cyanic acid or a carbamate group. See Green claim 1; abstract; col. 2, lines 1-11; and col. 5, lines 28-36. Thus, Green describes a

polymeric coating composition where a polymer resin with active hydrogen-containing functional groups reacts with a curing agent. The Green polymeric coating composition further contains a carbamate compound (c) that contains at least one carbamate group, but the primary film-forming component of Green is the polymer resin, examples of which are listed in col. 2, lines 14-27.

The background of Green indicates that curable coating compositions utilizing carbamate-functional resins provide significant etch advantages. However, there is no suggestion or motivation that a skilled artisan would gather from the combination of Green, Boisseau, and Ohrbom that would lead to a non-polymeric coating composition having a monomeric material having a plurality of active hydrogen groups. In each reference (Green, Boisseau, and Ohrbom), the respective coating compositions contain a polymeric resin (Green), a film-forming component (Boisseau), or at least two of the same compound linked that can further include polycarbonates (Ohrbom), where each in turn reacts with a crosslinker.

There is no suggestion or motivation in the combination of references to remove the polymeric resin / film-forming component / linked compounds to make a non-polymeric coating composition with at least one monomeric material having a plurality of active hydrogen groups. Consequently, no combination of the aforementioned references would produce the present invention, and the references provide no motivation or suggestion for modifying their coating compositions to recreate the non-polymeric coating composition of the present invention. The present invention is therefore nonobvious. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art, not in applicant's disclosure.).

In addition, compound (c) of the Green reference contains "at least one carbamate" group while the present invention describes a monomeric material having a "plurality of active hydrogen groups," which can be carbamate groups. A "plurality of active hydrogen groups" in the present invention requires at least two such groups. See, for example, paragraph [0024] illustrating various embodiments of the monomeric material having two carbamate groups; and see paragraph [0017] describing embodiments of the monomeric material comprising "at least two functional groups." The difference between having one carbamate group and two carbamate groups is important in the curing of a coating composition. For example, all three of the references cited by the Office Action contain other polymeric resins that react with a crosslinker to form a polymerized cured coating; these polymeric resins are missing from the present invention (i.e., the present invention is to a non-polymeric coating composition). In contrast, the present invention does not have a polymeric resin that reacts with a crosslinker.

The carbamate compound (c) from Green is further differentiated from the monomeric material of the present invention in that since compound (c) can have just one carbamate group, it would then react with a crosslinker at only the single carbamate moiety. As such, the cured coating composition in Green would be very different from the cured coating composition of the present invention where a non-polymeric coating composition having a monomeric material with a plurality (i.e., at least 2) of active hydrogen groups reacts with a crosslinker.

Thus, the present invention identifies and utilizes a specific species of carbamate containing compounds (i.e., monomeric materials having at least two carbamates) that are necessary for the present invention. A monomeric material having a single carbamate group would not function in a similar fashion and is not included in the presently claimed invention. Therefore, the monomeric material having a plurality of active hydrogen groups would not have been obvious in the combination of the aforementioned references, since each of the references contains a separate polymeric resin which can react with a crosslinker to provide a polymerized and cured coating. Addition of a single carbamate containing compound (c) from the Green reference can react with a crosslinker, but cannot participate in the same type of curing reaction as can the monomeric material having a plurality of active hydrogen groups of the present invention. Since there is no suggestion or motivation to remove the polymeric resins from the prior art references, and no suggestion or motivation to then use a monomeric material with a plurality (at least two) of reactive hydrogen groups in a non-polymeric coating composition, the present invention is not obvious. Withdrawal of the rejection and reconsideration of the claims are respectfully requested.



## CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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By: Anna M. Budde  
Anna M. Budde, Reg. No. 35,085.

HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. Box 828  
Bloomfield Hills, Michigan 48303  
(248) 641-1600

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